



The Working Group on Health Problems of Local and Migrant Populations in Arctic Regions was convened by the Regional Office in order to identify areas requiring further study with regard to the development of comprehensive health services for populations in arctic and subarctic regions. The Working Group met in Copenhagen from 12 to 17 September 1977.

HEALTH PROBLEMS OF LOCAL AND MIGRANT POPULATIONS IN ARCTIC REGIONS

drew attention to the topicality of the subject of the worldwide interest in providing primary health care services for previously underserved vulnerable groups and of the plans to intensify WHO's involvement in circumpolar health research. H.A. Akesson was elected Chairman and Dr. A. Hall, Regional Officer for Primary Health Care, acted as Rapporteur. The agenda of the meeting and the list of participants are given in Annexes I and II respectively. The Working Group was followed by a consultation on Circumpolar Health aimed at helping the role of WHO in this area. The twenty advisers participating in this Consultation are indicated in Annex II.

Report

Report

2. Working methods

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1. Introduction

Many past activities of the Regional Office for Europe of the World Health Organization have contained elements pertaining to health problems in the arctic regions. Arctic medicine has, however, been a relatively low priority area with no comprehensive programme. The Alma-Ata Declaration (ICP/ALA/CONF. DOC/1 Rev.1) and the recommendation to pay special attention to vulnerable and high-risk groups enhance the Regional Office's responsibility to develop policies for and initiate activities in circumpolar health. The first major step in this direction was the Regional Director's report (N3/48/18) to the Fourth International Symposium on Circumpolar Health, held in Novosibirsk, USSR, from 2 to 7 October 1978.

The Working Group on Health Problems of Local and Migrant Populations in Arctic Regions was convened by the Regional Office in order to identify areas requiring further study with regard to the development of comprehensive health services for populations in arctic and subarctic regions. The Working Group met in Copenhagen from 25 to 27 September 1979. Welcoming the participants on behalf of the Regional Director, Dr. M. Postiglione, Director, Disease Prevention and Control, drew attention to the topicality of the subject in the light of the worldwide interest in providing primary health care services for previously underserved vulnerable groups and of the plans to intensify WHO's involvement in circumpolar health. Professor H.K. Akerblom was elected Chairman and Dr H. Vuori, Regional Officer for Primary Health Care, acted as Rapporteur. The agenda of the meeting and the list of participants are given in annexes I and II respectively. The Working Group was followed by a Consultation on Circumpolar Health, aimed at defining the role of WHO in this area. The temporary advisers participating in this Consultation are indicated in Annex II.

2. Working methods

The meeting decided to delete from the provisional agenda an item pertaining to environmental health problems, because they would be dealt with in a Workshop on Environmental Health Problems in Arctic Areas, to be organized by the Regional Office in 1981. The remaining agenda items were examined from three different angles:

- (a) problem definition and current knowledge,
- (b) identification of areas requiring research, and
- (c) identification of services needed to solve the problems.

In this report, the two first items are discussed separately for each problem area, whereas there is only one joint chapter for service needs, as there are relatively few services specific to just one problem area. The recommendations of the Consultation are merged with the report of the Working Group.

3. Definitions and justification for WHO involvement

In the past, the following terms have been among those used to refer to health problems in arctic and subarctic areas: arctic medicine, arctic health and circumpolar health. The meeting felt that the most appropriate term was circumpolar health, because it emphasized health instead of disease and because it covered both arctic and subarctic areas, which shared many common problems.

The following definition was suggested to describe the areas, population, and health problems falling under this term:

Circumpolar areas are characterized by extreme climatic conditions and a widely scattered population. The population are natives in a process of acculturation and migrants in possession of an adequate technology for the exploitation of the natural resources of these areas. Most circumpolar health problems are not specific but are met with in other regions of the globe under similar circumstances. Only their combination is unique, justifying the term circumpolar health and specific actions.

The Arctic is defined as the area lying north of the isotherm $+ 10^{\circ}\text{C}$ average temperature for the warmest month of the year, this roughly corresponds with the timberline. Also in areas south of the timberline, many problems resemble those encountered in the Arctic proper. Therefore,

circumpolar health should encompass these subarctic areas as well. In the northern hemisphere circumpolar areas can be found in the following countries: Canada, Denmark (Greenland), Finland, Iceland, Norway, Sweden, USA, and USSR. In addition, all of Mongolia and northern China are subarctic areas.

The preceding characterization of circumpolar health implies several important principles:

(1) Population

There are two main population groups, the native population and the migrants. The migrants can, especially with regard to psychosocial problems, be divided into temporary migrants (e.g. workers coming to complete a defined task of relatively short duration), first-generation settlers (persons intending to stay permanently in the circumpolar areas, but who have lived part of their lives in noncircumpolar areas, and have their original domicile and possibly relatives in such areas), and second- or third-generation settlers (persons born in the circumpolar areas and intending to stay there).

The relative importance of these populations varies from country to country. In the Soviet Union, where the national policy consists of creating large new settlements in the circumpolar regions, the problems of the migrants, who number millions, are more important than those of the native population. In Alaska, Northern Canada and Greenland the problems of the native population are the prime focus of attention.

(2) Health problems

The native population and the migrants partly share their problems and partly have different problems. Both groups are confronted with a new culture. However, as the culture of the migrants is dominant, acculturation problems are much more difficult for the native population, constituting probably one of the main causes of their health problems. The migrants, especially the first-generation settlers, may also experience acculturation problems because they are uprooted from their original culture.

The native population may still carry the burden of some traditional diseases (e.g. contagious and parasitic diseases), but they are also confronted with health problems related to modernization and industrialization (e.g. occupational injuries and diseases, and "behavioural" diseases, such as some types of cancer and cardiovascular diseases). Genetic selection and long periods of social adaptation have usually enabled them to endure the harsh climatic conditions. The migrants have biological, psychological and cultural adaptation problems caused by the climate, darkness, lack of leisure activities, sexual deprivation, etc.

(3) Health services

There are few, if any, health service problems that are unique for the circumpolar areas. The main problem is that of long distances and small populations, which unavoidably render the provision of health services difficult and expensive. The effect of the arctic climate per se is often exaggerated, although it certainly affects such factors as the ability to provide care (e.g. flying presupposes clear weather), the time it takes to dress, and the choice of recreational activities. In this respect, there is a clear gradient from the real Arctic to the subarctic. Particularly in the subarctic regions, the effects of climate can often be minimized by means of social measures. Not even in the really arctic areas are all people exposed to the most adverse climatic conditions. In addition, the population living in these areas is relatively small. Also, there are great differences between the countries having circumpolar areas. In the Soviet Union, most settlements are large and can support all customary medical services, whereas it is unfeasible to try to provide small Indian and Eskimo villages in Alaska, Northern Canada and Greenland with the same amount and quality of services. People living under corresponding conditions (i.e. long distances and small scattered population) are often neglected despite the latitude. Consequently, the experience gained in service provision in the circumpolar areas should be valuable for other corresponding areas (e.g. arid areas and archipelagos) and vice versa.

(4) Dynamic picture

Population pressure and dwindling natural resources mean that man will try to extend his habitat to areas previously considered unsuitable for permanent settlements or suitable only for small native populations. Therefore the circumpolar regions will be the focus of increasing attention. Migration will inevitably create ecological problems and problems of acculturation. Similarly, attempts to live in adverse conditions will give rise to both biological and psychological adaptation problems.

The health picture of the circumpolar areas is a rapidly changing one. Some old public health problems, such as communicable diseases, still prevail, although their relative share of the total morbidity has greatly reduced. Many problems of environmental sanitation have also been solved, but, at the same time, new ones have been created. For instance respiratory infections and otitis media may be related to lack of ventilation in the new, very compactly built and well insulated houses. Growing industrial exploitation exposes both natives and migrants to occupational hazards, increasing the number of accidents and occupational diseases. The number of people exposed to problems encountered in circumpolar areas is rapidly increasing, particularly in the USSR, where large numbers of settlers are needed to exploit the natural resources.

Earlier, the circumpolar areas were inhabited by, in many respects, "abnormal" migrants. They were often goldminers and other similar individuals with great stamina and often of peculiar character. With the influx of new migrants and the increase in size of the new settlements in circumpolar areas, previously male-dominated populations have become more normal and now include more women and children; this results in a more diversified health and disease panorama.

With the increase in the size of settlements and the sophistication of technology used, the impact of new culture and technology has reached previously unknown dimensions. One of the basic problems is that we do not have the necessary skills and experience to predict long-term impact. A telling example of current attitudes is the following: when the impact of the Alaskan oil pipeline on the local ecology was being assessed, more consideration was given to the effects of the project on the caribou than to the possible impact on human beings.

WHO will be well advised to anticipate emerging problems by identifying them and developing solutions in advance. It is not sufficient to study the existing problems; a prognosis of future problems is needed. In this context, particular attention has to be paid to sociopsychological problems, as these are likely to be the most important ones.

4. Family health

4.1 Problem identification

With regard to family health problems, three main population subgroups can be discerned:

- (1) the native population;
- (2) permanent settlers, consisting of:
 - (i) first-generation settlers who have come from other areas and still often have contacts with them, being able to return to their original homes if they cannot adapt to arctic conditions;
 - (ii) second- and third-generation settlers who have spent all their lives in the arctic areas and consider them as their home.
- (3) persons who commute between their place of work in the circumpolar areas and their homes outside of these areas.

The problems differ according to the subgroup and country concerned. As to the native population, the two most important family problems are perhaps the generation gap and "no family".

Children educated in the realm of the new culture often fail to understand their parents and especially their grandparents, and become uprooted from their original culture. The same applies in the opposite direction to parents and grandparents. The children's feeling of being uprooted is often enhanced by the unstable educational system they are faced with. Their teachers change frequently, each of them bringing new influences, new values, and new ways of thinking, but the children remain the same and may get utterly confused. Among the native population, educational and professional advancement also creates family problems by separating family members for extended periods of time.

There is a curious paradox among the native population with regard to parental control. Although the birth rate is declining, resulting in smaller families, several generations may still live together. In the indigenous families it is relatively seldom that both parents work outside the home. One would assume, therefore, that this situation is conducive to successful socialization. The families are, however, clearly becoming disintegrated. A possible explanation might be that the traditional child-raising patterns among the native population were very permissive, relying not so much on parental as on societal control. With the advent of the new culture, the responsibility for primary socialization has been transferred from the parents to schools, where the old model of societal control does not operate.

The disintegration of family life is indicated by the "intermittent husband syndrome", the great number of divorces, babies born out of wedlock etc. The disintegration of family life is also manifested in the high prevalence of the "battered child syndrome" and of child neglect. Especially grave forms leading to death may be more common in the north than in the more southern communities. The neglect of children may also result in childhood accidents, especially when both parents are working. This trend is enhanced by the introduction of new technological gadgets and facilitated by the tradition of permissive child-raising patterns among the natives.

Another often neglected group among the native population consists of the elderly, in relative terms a rapidly increasing section of the population. Previously, they were considered a natural element of the family; now they are often rejected and left to be taken care of by the health or social welfare systems. Well-meaning health personnel may try to provide them with the blessings of modern medicine by bringing them to hospitals, often against their will. A long separation from the family, for instance in nursing homes during the terminal phases of a chronic illness, may result in problems that far outweigh the questionable benefit of having lived a little longer.

In summary, family health problems occurring in the circumpolar regions are not different in kind from those in other parts of the world. What renders them particularly urgent is the frequency with which they occur and the rate of the changes causing them. Small communities often serve as experimental laboratories, where reactions to stimuli, such as rapidly changing or disappearing cultural traditions, can assume exceptionally great dimensions. It should, however, be noted that the subgroups found in the circumpolar areas are not homogeneous, thus rendering generalizations dangerous. For instance, migrant families often have problems, but in Greenland, where the typical migrant families consist of professional people such as doctors and teachers, such problems are rare. The housing conditions of such migrants are good, their health status is usually excellent, and they appropriately utilize health services which are available for them. Among both the native population and migrants, the greatest family health problems are usually found among those who move from small settlements and rural areas to cities. In the USSR it has been found that the health status of the migrant population is lower in cities with a large migrant population. This observation has led to the development of models for predicting the number of sick children to be found in a community on the basis of the number of migrants. In cities with no great migration, the most important family health problems are related to antenatal life, pregnancy, and old age.

4.2 Research needs

Baseline data for all the circumpolar regions are needed so that the relative share of geographical, climatic, cultural and local factors in the morbidity pattern can be ascertained. To this end, standardized data are urgently needed. Better use should be made of the considerable wealth of existing data, although differences in definitions, reporting periods, standards, etc., hamper their effective use.

There is a characteristic difference between, on the one hand, health and, on the other hand, social welfare personnel and researchers. In the health service world, it is customary - at least in theory - to require full documentation of the effectiveness of a procedure or service before its implementation. In social welfare, the tradition has been to experiment with anything that promises to contribute to the solution of problems. As the problems of family health in the circumpolar areas are primarily of a social nature, the latter approach is gaining foothold in the provision of health

services in the arctic areas as well. Therefore, it is of paramount importance to include in all such programmes an evaluative component. One of the tasks of WHO could be to promote an evaluative approach, to develop simple indicators of success and to suggest standard questions and measurement items for inclusion in all such schemes. Evaluation would also be greatly facilitated by the development of health information systems, though these do not need to be very sophisticated. The most important point is to use standardized definitions and measurements. One of the specific benefits of an evaluation of ongoing and projected "social experiments" is that they may demonstrate that health care can be provided at a less sophisticated and costly level than that usually advocated by health workers who think along traditional lines.

The suggested indicators can be quite simple: infant mortality, mortality below five years of age, life expectancy, juvenile delinquency, the relative share of the total budget used for social services etc. The most important objective is to standardize these indicators and to use them universally. Comparative studies on the organization of health services, especially of front-line (primary health care) services, are needed. Their value would be enhanced by the use of common output indicators.

As to specific areas pertaining to family health and requiring further research, the problems of family infection, the "battered child syndrome", and the problems of "non-families" should be mentioned.

5. Noncommunicable diseases

Under this heading, the following groups of diseases were discussed:

- (a) cancer,
- (b) cardiovascular diseases,
- (c) autoimmune diseases.

5.1 Problem identification

- (a) Cancer

In all circumpolar areas, the cancer statistics are fairly comprehensive, although the extent to which they are based on autopsies varies considerably. This renders comparisons somewhat risky. There are also differences in the intensity of case-finding, both between the circumpolar areas in various countries and between the northern and southern areas within countries. However, as both the autopsy rate and the intensity of case-finding are probably lower in the circumpolar areas than in the other parts of the respective countries, the observation of a particularly high incidence is probably a correct one, the figures being just as reliable as for other parts of the countries concerned. For instance, in Greenland, fewer autopsies are performed, but biopsies are frequent and a high proportion of suspected cases of cancer are sent to Denmark for diagnosis and treatment. Thus the diagnosis usually is a definitive one, although the patients often die in Greenland and autopsy is not carried out. It should, however, be noted that biopsies have been used increasingly during the last few years. This may explain the rising trends in some forms of cancer and especially changes in the relative share of a particular type of cancer among all cancers.

In view of these factors, the observations on high incidence of oesophagus cancer in Greenland and in Siberia among the Yakuts, of liver cancer in Alaska and along the Ob River in Siberia, and of cancer of the thyroid in northern Norway are probably well based and deserve further study. Although the absolute numbers of cancer cases may be relatively low, given the small size of the population, there may be rising trends which suggest important changes in the environment or in living habits. Changes in life expectancy may, however, render the assessment of secular trends difficult.

- (b) Cardiovascular diseases

The assumed low incidence of cardiovascular diseases among the native population in circumpolar areas has been of great interest to researchers. In spite of this interest, adequate information systems to monitor current trends are lacking. A singularly important opportunity to study the etiology of these diseases may be missed if such systems are not developed. It is also unfortunate that the best information on cardiovascular diseases and cancer seems to come from Greenland, which has the lowest population base. This gives rise to random errors, and generalizations from these data will be dubious. The problem of small numbers is probably unavoidable, but it does not justify

the practice sometimes noticed, namely to combine various subgroups to obtain a larger denominator. Differences between subgroups can provide valuable epidemiological hints as to the etiology of the diseases.

These provisos being borne in mind, the available data on native Canadian populations seem to indicate that hypertension and coronaries do not exist. As to Svalbard, it is difficult to get information, but in northern Norway cardiovascular diseases are more frequent than in parts of the country further south. Of the ethnic groups (Norwegians, Lapps and Finns), the Finns have the highest incidence of cardiovascular deaths.

The data on arteriosclerosis, coronary diseases, and hypercholesterolemia raise some doubts as to whether the theory that arteriosclerosis is the main cause of myocardial infarctions is correct. In Greenland, there is evidence that the low incidence of myocardial infarctions may be due to decreased aggregation of platelets, which in turn gives rise to a higher bleeding tendency in Eskimos.

(c) Autoimmune diseases

There are clear differences in autoimmune diseases between northern and southern areas within countries. For instance, in Greenland certain tissue antigens are missing, and this may be the reason why some autoimmune diseases such as rheumatoid arthritis of the spine and diabetes do not occur. Multiple sclerosis is not reported and thyroiditis is very rare. However, it is not clear whether this is related to the latitude or to some other factor. One of the theories advanced to link the geographical region and pattern of autoimmune diseases is viral infection. Auto-immunization may be initiated by viral infection, and if the virus in question (possibly Coxsackie) does not occur in the area, the disease does not appear either.

5.2 Research needs

There are special research needs with regard to all the major groups of chronic diseases. As to cancer, a tactical objective is to investigate its location. A strategic objective is to develop a better understanding of the phenomenon of "cancer" in the Arctic. There may be changes in the immunological system, in the metabolism, and in the prevalence of acute and chronic inflammations. Rapid changes in the environment may also be conducive to an increase in the incidence and prevalence of cancer.

With regard to cardiovascular diseases, it would be very interesting to study the general pathological pattern of cardiovascular diseases in the circumpolar areas, particularly the development of arteriosclerosis with age. Victims of accidents should be autopsied, and the condition of their circulatory system studied. The relatively high infant mortality facilitates autopsy studies, which could provide valuable information about the earliest stages in the development of arteriosclerosis. In the USSR, it has been found that the clinical picture of arteriosclerosis changes in migrants from the south to the north. Such changes, and the underlying mechanisms, warrant studies. With regard to health services research, it would be of particular interest to study methods of dealing with sudden cardiovascular emergencies in scattered populations.

6. Communicable diseases

6.1 Problem identification

Currently, probably the most important group of communicable diseases consists of venereal diseases. They are particularly common among the indigenous population in Greenland and Alaska. In Greenland, gonorrhea, syphilis and soft ulcer have occurred. Quick diagnosis and easier treatment by means of long-acting penicillin have resulted in a decline in syphilis. The prevalence of soft ulcer has also decreased after its inception a few years ago, because the disease is painful and thus quickly leads to treatment. In the USSR the prevalence of gonorrhea has increased among migrants, although no epidemics have been seen. In Svalbard, venereal diseases have not been a particular problem. In northern Norway, there is a slightly higher prevalence than in the southern parts of country.

Two special problems pertaining to infectious diseases that are relatively poorly investigated and, according to the findings of Soviet scientists, deserve additional research, are family infections and placenta barrier. It often happens in arctic areas that when one member of the family is sick, the others also are infected without exhibiting any symptoms. In such cases, all the members of the family have to be treated. In native populations, domestic animals are also involved in this cycle. Family infection emphasizes the importance of adopting a holistic and comprehensive concept of the family in arctic medicine.

Otitis media is a common ailment among children living in the arctic areas. Its immediate reasons seem to be relatively well understood: dry air and excessive heating. There may, however, be much deeper reasons; for instance in Alaska, breast-feeding among the native population has declined, resulting in lower resistance to chronic infections. Recently, due to health education, breast-feeding has increased and there seems to be a concomitant fall in the incidence of otitis media. Besides the immunological factors, social factors also may play a role in the difference between breast-fed and bottle-fed children regarding the incidence of otitis media. When a child is bottle-fed, it is often taken care of by another child, who does not necessarily notice that the baby is ill. This results in delayed recourse to care. Otitis media is a typical example of a disease requiring cooperation between many disciplines, including medicine, social sciences and engineering.

Some of the parasitic and communicable diseases are intimately connected with medical anthropology, customs, eating habits, etc., some are due to isolation, which prevents silent immunization and renders the communities particularly vulnerable when a disease is introduced. Water supply, sewage disposal and food preparations are obvious etiological factors. Hydatidosis and rabies also deserve a mention as communicable disease problems.

7. Psychosocial problems

7.1 Problem identification

Most of the psychosocial problems of both the native population and the migrants stem from acculturation. The health problems are primarily symptoms of the basic problems of confrontation of two cultures and of becoming uprooted from one's own culture.

The development in Greenland provides a good example of the etiology of psychosocial problems. When the new culture began to exert its influence on a larger scale, those Eskimos best versed in the traditional skills resisted this influence and stayed in their original settlements, whereas the poorer elements were more ready to move to the new settlements where they obtained the best available "new" jobs, best housing, etc. When the traditional leaders finally had to move to the new settlements, they found that they were less well placed. The resulting loss of self-esteem was tremendous and caused many problems. This example also demonstrates that social planning is one of the keys to preventing the emergence of psychosocial problems.

Two particularly alarming symptoms of psychosocial problems are suicides and alcoholism.

7.1.1 Suicides

Among the Alaskan natives there is a clearly discernible epidemic of suicides. Suicides often occur in clusters, one case triggering others in a community. The peak age of this epidemic, 25 years among the Alaskan natives, has given rise to a hypothesis according to which those who now commit suicides are children of parents suffering from and being treated for tuberculosis during the 1950s. Because of the institution-based treatment, many families were split up and the children somewhat neglected. In northern Canada the figures for suicides are smaller, but the trend is similar to that in Alaska. Suicides occur primarily among Eskimos, not so much among Indians. In northern Norway and in Svalbard suicides are relatively rare. Suicides, as well as another common problem, homicides, are often related to the consumption of alcohol.

7.1.2 Alcoholism

High alcohol consumption, with concomitant health and social problems, is a common feature of all circumpolar areas, and of migrant as well as of local populations, although the problems may be more conspicuous among the native population. It is not well understood why the native population so easily falls prey to alcohol, but it is clear that difficulties in acculturation play an important role. The alcohol policies of these areas are scarcely designed to abate the problems. In Alaska, for instance, importation of alcohol to the State is encouraged in many ways, though this does not in itself explain why all the imported alcohol is so eagerly consumed.

In Greenland, the new restrictions on alcohol consumption imposed after the introduction of home rule in May 1979 seem to have curtailed consumption. Other countries with similar problems would be well advised to keep a close watch on the experiences of Greenland.

7.2 Research needs

Because of the urgent nature of the problems, new approaches to services and research are needed in the area of psychosocial problems in the circumpolar areas. Some of the highest research

priorities are studies on the manifestation of psychosocial problems, on models for organizing health and social services and utilizing various categories of health and social welfare personnel and on causes and treatment of alcoholism and drug dependence.

Several examples of promising leads in research on alcoholism can be cited. In the Soviet Union, it has been found that the clinical picture of alcohol intoxication among migrants differs from that observed in the native population. This is related not only to cultural differences, but possibly to differences in metabolism of alcohol as well. The impact of alcohol consumption on the offspring, both among the native population and migrants, also deserves further studies. Soviet scientists have demonstrated sperm changes under the influence of alcohol and have suggested that it would be interesting to follow up children conceived when the fathers were intoxicated.

For all alcohol-related studies, and particularly for epidemiological investigations, reliable data on alcohol consumption are of paramount importance. Alcohol consumption data pertaining to the northern areas are probably reliable because all the alcohol imported and legally produced locally is probably locally consumed. There are, however, gaps in the data with regard to home-made alcohol. A clear deficiency is that the consumption data do not tell very much about the distribution of consumption by locality, age, sex, socioeconomic characteristics, etc. The effect of alcohol is to be studied in more detail, the consumption data should be broken down by various subgroups and information systems for the systematic monitoring of consumption be developed. Other consumption data, such as that relating to tobacco, food additives, etc., should also be collected and studied.

WHO has launched a study on "Community response to alcohol-related problems", in which USA and Canada are participating. In the USA, one of the study groups consists of native Alaskan population. The protocol of this study, or at least parts of it, could be used in other countries with circumpolar areas to study alcohol-related problems.

The speed with which change takes place in the circumpolar areas may be the decisive factor in the etiology of psychosocial problems, which probably constitute the most important group of health problems in areas under western influence. A slower rate of exchange would allow the native population and migrants to adapt to the new culture and to test various adaptation mechanisms. Biological explanations are, however, not excluded and should be sought when feasible.

The relative powerlessness of the health care system in the face of most sociopsychological problems may depend on where we stand with regard to our knowledge and the possibilities of intervening. In this respect, three stages can be discerned: (1) problem definition phase, (2) explanatory phase, and (3) intervention phase.

With regard to many biologically determined health problems, we have already reached at least the explanatory phase, in some cases even the intervention phase. With regard to the psychosocial problems we are still at the problem definition phase. The situation in the north reflects that in more southern areas, where the sociopsychological problems, in spite of the much greater resources available, have largely remained unsolved. Therefore, attempts to intervene are often based more on faith and zealotry than on any scientifically based model. This does not, however, mean that interventions should not be tried. They are welcome, even when all the answers are not yet available, but an evaluation mechanism should always be inbuilt, so as to permit a critical assessment of the achievements. In the evaluation standardization is of paramount importance so as to enable solutions that are found efficient to be exploited in other areas.

8. Adaptation to adverse environmental situations

8.1 Problem identification

Adaptation to ecological changes is a global problem, but the rapid change and the harsh climate renders it particularly difficult in circumpolar areas. Migrants have to adapt not only to the climate but to new environmental factors as well. The natives are often genetically adapted to the climate; for them, adaptation to the ecological and cultural changes ushered in by industrial exploitation and by an alien culture is most important. It is particularly useful to be able to develop models for forecasting the long-term impact on health of life in northern areas. This is especially important in countries with large migrant populations, such as the Soviet Union. Such models would probably reduce the costs of health care in the future.

The Soviet Union has a long tradition of research in biological adaptation to the northern climate. Much is already known about short-term adaptation, but long-term effects are still largely unexplored. On the basis of current knowledge, it seems that long-term and short-term adaptation

are biologically two distinct phenomena, as are pathological processes resulting from long-term and short-term stress. Some people, called "sprinters", seem to adapt admirably during the first year, but later develop maladaptation syndromes and may have to return to more southern areas. Others have adaptation problems during the first year but thereafter become adjusted and seem able to remain in the arctic areas for prolonged periods of time. As unmarried newcomers to the arctic areas often get married only after the first year, this mechanism may result in a population genetically better adjusted to the arctic conditions. In other countries, it has been noted that adaptation is facilitated when the newcomers bring with them as many features of their original environment as possible, although this is at the same time, conducive to maintaining a gap between the local culture and that of the migrants.

The migrants should be assisted in their adaptation by being provided with the necessary skills and knowledge. The experience gained in training people for work in developing countries could be exploited with advantage. In particular training in social psychology and anthropology would be helpful, although it should be emphasized that personality is the most important determinant of successful adaptation - and personality cannot be influenced very much by training.

8.2 Research needs

When large numbers of settlers are concerned, smooth adaptation to the adverse conditions is particularly important. It could be facilitated by giving advance guidance and counselling to those intending to go to circumpolar areas. In the Soviet Union, it has been demonstrated that perhaps fewer than 30% of the potential migrants will be effective workers for a longer period of time. Counselling services presuppose adequate knowledge. Reliable indicators of health are of special importance. In arctic and subarctic areas, something that under other circumstances may be considered a disease can be in fact, an adaptive reaction. For counselling purposes, criteria for recognizing "sprinters" and persons capable of long-term adaptation should be developed. In the Soviet Union, some criteria are already being used in testing people who intend to go to the arctic areas. The probably good adapters have a greater capacity to sustain muscular contraction. In the "sprinters", training leads to increased muscular power, while in the good adapters it results in prolonged duration of muscular function. There are also differences in the blood and in the hormone spectra.

Health criteria are needed to detect early symptoms of exhaustion caused by maladaptation. The polar tension syndrome has been subject to extensive research in the Soviet Union. If this condition could be detected at an early stage, future and more serious diseases could possibly be prevented, especially in children.

According to the findings of Soviet scientists, the treatment of many diseases differs in the circumpolar areas from that customary in the south, necessitating research in "arctic" physiology and pharmacology as well as in clinical medicine. For instance, some drugs may be less effective in circumpolar areas than in the south. As a consequence, larger doses may be needed. Sometimes a treatment initiated in the south may be unsuitable in the north. Guidelines for appropriate drug treatment and research in geographical pharmacology are needed.

9. Training of health personnel

In any discussion of the education and training of health personnel for work in circumpolar areas, two populations have to be kept in mind: the natives and the migrants. With regard to the former group, the optimal solution for the future may be to recruit health professionals exclusively from the local population. This approach would solve many problems caused by the cultural and language barriers. Many countries have attempted to facilitate the training of the natives. In the Soviet Union, they are exempted from entrance examination to training institutions and they may be sent to higher level educational institutions at the State's expense. Lower-level institutions have been founded in the circumpolar areas. The trainees usually receive the practical training that is a part of their formal education in their own communities. It has been found that after graduation they usually return to the circumpolar areas. For instance, among the Yakuts, 50% of all health professionals are natives.

This approach is, however, by no means free of problems. In most areas concerned, the small population base renders it very difficult to find the necessary numbers of relatively highly trained personnel. Even if enough promising candidates could be recruited, it is economically unfeasible

to locate all the necessary training institutions in the respective areas. Sending the trainees to outside institutions may, in turn, nullify the benefits gained by recruiting them from among the native population. In their new training institutions they may become immersed in the prevailing culture.

Another obvious problem related to this approach is that of the "brain-drain". If the most promising indigenous students are encouraged to study in universities and other educational institutions outside their own area, they may be tempted to stay there. Incidentally, the brain-drain can be used as a counterargument to appease ethical worries relating to dual standards. Being content with fewer and poorer training opportunities for the natives is clearly an example of dual standards, which may be opposed in the name of democracy and equality of opportunity; it may be requested that the natives be given the same quality of education as other citizens of the country. Inequality may, however, in some cases be a lesser evil than brain-drain.

If the population, including the native population and the migrants, is large enough, it is preferable to arrange the training of health professionals in the circumpolar areas themselves. The experience gained in Finland (University of Oulu), Norway (University of Tromsø), and Sweden (University of Umeå) has been encouraging. The majority of the students at these universities have come from the surrounding areas and have stayed in the north after graduation. In addition to this beneficial effect, the medical schools have themselves increased in scope, particularly regarding the supply of highly specialized services in previously underserved areas.

In most circumpolar areas it is necessary to rely on health professionals coming from outside. In areas such as Siberia, where the migrants form the majority, this is self-evident. In theory, it might be preferable to have a special training programme for health personnel (particularly for physicians and nurses) intending to work in the circumpolar areas, emphasizing aspects characteristic of circumpolar health. In practice, however, it may be impossible to gear the entire education to the needs of arctic areas, particularly if the populations to be served are small and the education is not arranged in these areas. It takes a few years of experience for practitioners to grasp the really significant features of circumpolar health. As a consequence, continuing education is the best way of imparting the knowledge and skills needed in the circumpolar areas. In addition to biological factors influenced by circumpolar conditions, family health, sociopsychological problems, team work, acceptance of auxiliaries and self-care are aspects that should be emphasized in continuing education designed for health practitioners in circumpolar areas.

Although a "self-supporting" indigenous health care system is in most cases an impossibility because of the small population base, the health services should be provided by members of the native population as far as possible. In this context, the encouraging example of the Alaskan community health aide, a person selected by her own community, and trained in a relatively short period of time in certain specific skills may be mentioned. She provides up to 80% or 90% of all the health services needed in small local communities. In Canada, a dental school with a short curriculum intended primarily for the native population, has been founded. In spite of initial opposition by the dental profession, the graduates have now been accepted and provide about 50% of all dental services in the Northwest Territories. In planning such training, a proper task analysis is important. Educational planning should also be linked to service planning, and vice versa, i.e. the concept of health services and manpower planning (HSMD) should be implemented. The services should be planned in such a way that the available educational resources can produce the necessary manpower. Too often southern standards are applied in planning health services, although there are no realistic possibilities of producing or finding the necessary manpower.

The increased use of auxiliary health personnel and the delegation of tasks to personnel in existing categories, two methods often suggested for rationalizing the health manpower structure, are applicable in the circumpolar areas as well. There is a clear need for auxiliary personnel, particularly for auxiliaries recruited from among the native population, as they can provide socially acceptable services in an economically feasible way. It should, however, be stressed that it may be harmful to have too many categories of auxiliaries, each specializing in a narrow range of tasks. Delegation is naturally a sound principle but can be difficult to implement in a situation where there is an acute overall shortage of health personnel. Although the use of auxiliaries and the delegation of tasks are undeniably steps in the right direction, it should be noted that advocating these measures, particularly if their implementation is impractical, may sometimes constitute an attempt by the more educated health personnel, particularly physicians, and sometimes nurses also, to avoid assuming responsibility for sociopsychological problems.

In the small and scattered settlements which are typical of most circumpolar areas, individuals have a heightened personal responsibility to take care of their health. Self-care, family care and mutual aid groups assume a central role in the provision of health services under such circumstances. As a consequence, objective consideration will have to be given to self-care and its possible role in solving health problems, particularly those related to chronic diseases. Although self-care is, to a large extent, a community affair and responsibility, official health education could also be geared to encouraging appropriate and effective elements of self-care.

As for traditional medicine, there are diverging opinions. The prevailing attitude seems to be that if there is any traditional medicine to speak of among the indigenous populations in circumpolar areas, it should be let alone. If it has died, as most suspect, it would be artificial to revive it. In other parts of the world, local midwives are an important component of traditional medicine. In circumpolar areas, the number of births taken care of by local midwives is so small that this group is rapidly becoming extinct. Consequently there is no need to encourage them and to make special efforts to co-opt them in the official system.

There is a certain parallel between small isolated settlements, research stations, meteorological stations etc., on one hand, and, ships on the other. In maritime medicine, self-care has been encouraged and various aids, such as decision-making algorithms for diagnosis and treatment, have been developed. The experiences gained in maritime medicine could probably be used with advantage in circumpolar medicine.

10. Service implications

There are relatively few health problems that are unique to circumpolar areas. Accordingly, it is difficult to pinpoint specific services that would be needed exclusively in these areas; the service problems are primarily related to feasibility and costs and solved by selecting the proper mix and qualitative level of services and personnel to provide these services. Such considerations inevitably lead to ethical issues related to the justifiability and acceptability of dual standards. It should, however, be noted that the quality issue is often obfuscated by mixing the consumers' real needs with the wishes of health personnel. An example of this confusion is the proper treatment of elderly patients particularly those with a chronic disease. According to conventional medical wisdom, the right procedure is to bring such patients to hospitals and other bastions of high-technology medical care so as to let them benefit from the blessings of modern medicine. In many cases this is economically unfeasible, socially unjustifiable and even medically harmful. Thus, the basic principle is to bring the services to the client. This means that the corner-stone of health services has to be primary health care.

A similar point can be made with regard to appropriate technology. Health professionals often require more sophisticated technology than the needs of the population necessitate. For instance, it is impossible to provide small and scattered populations with high-technology obstetrical services. Fortunately, experience has shown that such services are not necessary. In Alaska, the infant mortality has markedly decreased without them. An urgent task is to identify those elements of modern health technology that should be made universally available and that have the highest cost-efficiency ratio. A closely related task is to develop guidelines for classifying patients according to their risk so as to provide them with care at the lowest effective level.

It should, however, be emphasized that there are great differences between areas and countries. In the far north and in the small scattered settlements, relatively simple primary health care services are the basis of health care. Further south, where the settlements often are larger, specialized services can be afforded and organized. In the Soviet Union the situation is rather different. Many of the settlements even in the far north are large enough to enable the provision of the full array of health services. Because of the various incentives available to health personnel working in the north, all vacancies are usually filled and the health authorities can in fact choose the best from among the many qualified candidates. These incentives include yearly salary increments, higher pensions, and special refresher courses focusing on the health problems prevalent in arctic areas.

In Norway, the example of Svalbard where there is no indigenous population, demonstrates that many problems related to the provision of adequate health services for small and scattered populations can be solved by means of sufficient investments. The willingness to invest in health care in such areas is, however, determined by the profitability of the activity that brings people to these areas.

If the activity is profitable enough (e.g. coal mining in Svalbard or oil drilling in Siberia and Alaska), it pays to invest in the health care of the workers. Unfortunately, the economic activities of the native population tend to be such that those who control the finances do not consider large investments in the health of the native population be warranted from the cost-benefit point of view, although from the human point of view they certainly would be.

While relatively few of the problems discussed require specific solutions as far as the organization of services is concerned, some points deserve special attention. Perhaps the most important problems occur in the field of family and mental health. In Alaska, consultant specialists have provided mental health services to the native population. The results have not been particularly encouraging; the visits have been too infrequent because not enough manpower is available. Furthermore, the specialists have been alien to the communities and their services have not been used effectively. In Norway, a somewhat modified approach has been more promising. Teams of psychiatrists, psychiatric nurses, and social workers visit the local communities once a month. They see former patients, give consultation aid to the local health personnel, and discuss all problems pertaining to mental health with community representatives. In the Soviet Union, special efforts have been made to recruit members of the native population to become psychologists and psychiatrists.

In spite of the partial success of specialist-based schemes, the responsibility for mental health and family health will have to be vested in the primary care personnel and communities themselves. Here the major problem is that in the traditional training of health professionals sociopsychological problems are largely neglected. There is, however, a new salutary trend to transfer the training from hospitals to the communities, particularly in nursing. The new generation of nurses, trained in the spirit of community health, may well form the future corner-stone of the entire primary health care system. Another obvious solution is to place greater reliance on self-care and mutual aid groups, as well as on community health aides.

With regard to chronic diseases, as long as they cannot be totally prevented, secondary and tertiary prevention assume a most important role. On the one hand, to transfer handicapped members of the native population from their home environment to institutions in cities would be tantamount to a catastrophe; on the other hand, this environment is likely to cause special hardship to persons with impaired functional capacity. They should therefore be helped to adapt to live in their own community with their impairment. The real challenge - requiring innovative research and service approaches - is to maximize the functional capacity of a person who has to face harsh environmental conditions and to bear the additional burden of an infirmity.

Because small settlements may constitute genetic isolates, genetic counselling has sometimes been recommended as a special service in circumpolar areas. However, this may not be very effective. Understanding the theoretical background and objectives of genetic counselling requires a high level of conceptual sophistication. Families who already have children with genetic disorders may decide to go on reproducing till they have a healthy child, instead of limiting the number of their children. Indigenous populations are not quite as isolated as is commonly believed, because their culture often encourages social contacts with other settlements, thus reducing the effect of inbreeding.

Veneral diseases constitute a continuous public health problem in arctic areas. The example of Greenland demonstrates how important it is to develop quick diagnostic tests and modes of treatment that are not socially stigmatizing or too cumbersome for the patient. In spite of such advances, additional new approaches to the control of venereal diseases are needed. In Alaska, health education on venereal diseases is no longer directed towards changing sexual behaviour but instead aims to help individuals to recognize symptoms, seek care and report contacts. Small, susceptible and isolated populations have been screened for gonorrhea, followed by treatment. This relieves such populations from gonorrhea for a few years. There have also been attempts to monitor certain key groups such as sailors and migrant workers.

The level of health of the native population is naturally closely related to many socioeconomic factors, one of the most important being education. To facilitate positive acculturation and to prevent sociopsychological problems, the school system should prepare the children of local families for two cultures. Opinions as to the best approach are, however, mixed. In the past, the Swedish school system focused on the skills needed in the traditional Lapp culture. This approach failed and now Lappish children get the same education as other Swedish children. In Alaska, the trend seems

to be reversed. In the past, the educational system did not take ethnic origin into account; now more emphasis is placed on aspects pertaining to the traditional local culture. It is hard to say which of these is the correct approach, but the experiences should certainly be compared. Many countries have attempted to facilitate university-level studies for native populations. The results have been generally discouraging, with high failure rates. The difficulties encountered include language and cultural differences, poor motivation of the children and lack of encouragement by the parents.

11. Conclusions and recommendations

11.1 Conclusions

The conclusions reached by the Working Group and the Consultation may be grouped under four headings:

- (a) general (conceptual issues and definitions),
- (b) research,
- (c) health manpower development, and
- (d) health services.

(a) General

- (1) Of the existing options, the term "circumpolar health" is the most suitable, because it emphasizes health and covers both arctic and subarctic areas.
- (2) WHO activities in circumpolar health should be of interest for the following countries in the northern hemisphere: Canada, China, Denmark (Greenland), Finland, Iceland, Mongolia, Norway, Sweden, USA and USSR.
- (3) In circumpolar health, two principal population groups have to be distinguished: the native population and the migrants. This distinction is important because the morbidity patterns of these groups differ. Even when the health problems are the same, their solution may require different approaches, due to differences in living conditions and cultural traditions.
- (4) Within both the native population and the migrant population, two subgroups deserve special attention: children, because they are particularly affected by all adverse health trends (they are abused, neglected, they suffer from acculturation problems, they are most sensitive to infectious and other environmental agents) and the elderly, because they are often neglected in a rapidly changing cultural climate and because their numbers are increasing in relation to the total population.
- (5) The health panorama in the circumpolar areas is a rapidly changing one. Many traditional diseases still plague the natives, who are also exposed to a new culture, to urban life and to obnoxious factors related to the industrial exploitation of the circumpolar areas. This has resulted in a rapid increase in "behavioural" diseases and psychosocial problems. The migrants have acculturation problems and problems caused by adaptation to adverse climatic conditions and rapid ecological changes.
- (6) There are relatively few health problems that are unique to the circumpolar areas; it is primarily the combination of these problems that justifies the use of the term circumpolar health. Similarly, it is difficult to pinpoint services that would be needed exclusively in north. Long distances and scattered, small populations are the cause of most service problems, just as in many other parts of the world (e.g. arid areas and archipelagos).
- (7) Because of the common nature of the problems, the experiences gained in circumpolar areas are applicable in many other areas as well.
- (8) In circumpolar health, many of the acute problems can be solved, but we are not aware of the scale and weight of future problems caused by the rapid rate of change in the circumpolar areas and

likely to become aggravated because of increasing exploitation of the natural resources found in these areas and the concomitant influx of new migrants. Therefore, the focus of circumpolar health has to be shifted to devising new strategies to deal with emerging problems and to developing new methods for assessing the impact of changes. The new strategies also imply a change of emphasis from clinical medicine to community medicine and public health.

(9) Key concepts in the new strategies are "systems approach" and "multidisciplinary approach".

(b) Research

(1) Some of the most salient research tasks in the future are:

- reassessment of morbidity trends (both infectious and chronic diseases),
- analysis of factors promoting health in circumpolar areas,
- development of monitoring and information systems for the health care system,
- promotion of standard methodology for epidemiological, sociopsychological, psychiatric and anthropological studies,
- development of guidelines for evaluation,
- setting up a clearing-house for information pertaining to morbidity and health services in circumpolar areas,
- development of models for predicting health consequences of ecological, cultural, and demographic changes.

(2) Some areas of research deserving specific attention are:

- northern physiology, pathology, pharmacology, and clinical medicine,
- social factors in the etiology of both communicable and noncommunicable diseases,
- gerontology and geriatrics,
- family health,
- psychosocial problems (family disruption, child abuse, alcoholism, drug abuse, suicide),
- occupational health,
- housing and community planning,
- medical anthropology (cultural and language barriers, customs, traditional medicine),
- self-care.

(3) In the area of health services research, development and evaluation of various service provision models (particularly in relation to domiciliary services, use of various personnel categories, and treatment of emergencies) are needed.

(c) Health manpower development

(1) The application of the health services and manpower development (HSMD) concept is of paramount importance, i.e. the planning of health services and of the training of health personnel have to be coordinated.

(2) Task analyses of all categories of health personnel (particularly in primary health care) are needed to provide a solid basis for health manpower development planning. In this context, the use of various auxiliaries and the possibilities of delegating tasks have to be reviewed.

(3) There is a clear need for manuals and other educational material adapted to the needs of circumpolar areas. Such material should be prepared not only for professional training purposes but also for self-care.

(4) There is a need for an educational clearing-house, i.e. a centre that would collect all the available information pertaining to educational innovations and experiments.

(5) The potential role of self-care in the provision of health services has to be analysed.

(d) Health services

(1) Experimentation with various mixes of health and social work manpower is needed. In this connexion, the appropriate training standards have to be established.

(2) Experimentation with other components of the service delivery systems (e.g. communication, technology, transport, self-care) is needed.

(3) Recommendations concerning the appropriate technology for health at different levels to be used by various categories of health personnel are urgently needed.

11.2 Recommendations for WHO

The Working Group and Consultation felt the following recommendations, many of them already implied in the preceding conclusions, to be particularly appropriate for implementation by WHO.

(a) General

(1) Due to the increasing importance of the circumpolar areas and their specific health problems, WHO should have a programme in circumpolar health. Because problems of circumpolar health are encountered in countries belonging to several WHO regions, the programme should be global. The Regional Office for Europe should be designated the focal point of this programme.

(2) WHO should promote an approach based on systems analysis and multidisciplinary action in dealing with the problems of circumpolar health.

(b) Research

(1) WHO should act as a clearing-house on research pertaining to circumpolar health.

(2) WHO should promote standardization of methodology used in epidemiological, sociological, psychiatric, anthropological and other studies. Special attention should be paid to the development of standard definitions, questions, data collection procedures and reporting periods.

(3) WHO should assist Member States to develop information systems to be used in the circumpolar areas, particularly by defining the minimum data set needed for comparisons between areas and over time.

(4) WHO should initiate, encourage and coordinate international comparative studies on circumpolar health. In particular, geriatric, family health and psychosocial problems deserve attention. Furthermore, indigenous health practices, including self-care, family care, mutual aid, etc., need to be studied.

(5) WHO should initiate, encourage and coordinate evaluative studies. Particular attention should be paid to the inclusion of an evaluative component in all innovative service models.

(6) WHO should foster contacts between scientists of different countries, and facilitate communication within the scientific community.

(7) WHO should publish reports on results of research when applicable.

(8) WHO should designate collaborating centres on circumpolar health and maintain contacts with other bodies interested in circumpolar health. Such bodies include the Nordic Council for Arctic Medical Research and the Academy of Sciences of the USSR, Siberian Branch. WHO should also participate in the planning and implementation of international meetings, conferences, etc., on circumpolar health. In connexion with the Fifth Conference on Circumpolar Health to be held in Copenhagen, in August 1981, WHO could possibly arrange working groups on alcoholism and the delivery of health services in the home.

(c) Health manpower development

(1) WHO should promote the concept of health services and manpower development (HSMD).

(2) WHO should assist its Member States, possibly through the collaborating centres, to produce learning material adapted to the needs of circumpolar health.

(3) WHO should produce and assist its Member States to produce learning material suitable for self-care in the circumpolar areas.

(4) WHO should encourage and assist its Member States to define the functions of various categories of health personnel and set standards for training.

(d) Health services

(1) WHO should develop standards for appropriate technology for health at various levels.

AGENDA

1. Problems of family health in circumpolar areas, with particular emphasis on the public health aspects, particularly the organization of primary health care, the role of health centres in such situations, and the need for appropriate development of alternative methods of delivery of care in remote areas.
2. Problems of noncommunicable disease prevention and control, as well as communicable and parasitic diseases common in circumpolar areas
3. Review of studies in the field of psychosocial problems as these affect populations in this area and the relationship of such psychosocial problems to the incidence of sexually transmitted diseases and alcoholism, particularly among migrant workers
4. Problems of adaptation to adverse environmental situations and consideration in particular of the provision of appropriate housing in such centres of habitation
5. Consideration of the special needs for education and training of health personnel as well as health educational programmes for persons living in these areas
6. Conclusions and recommendations

ANNEX II

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Date Due

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